SHARP®

ELECTRONIC CALCULATOR

OPERATION MANUAL

MODEL
QS-2130

COMPET

OPERATIONAL NOTES

Thank you for your purchase of the SHARP electronic calculator, model QS-2130.

To insure trouble-free operation of your SHARP calculator, we recommend the following:
1. The calculator should be kept in areas free from extreme temperature changes, moisture, and dust.
2. A soft, dry cloth should be used to clean the calculator. Do not use solvents or a wet cloth.
3. The solar cell is delicate. It should not be pressed or tampered with.
4. If service should be required on this equipment, use only a SHARP servicing dealer, a SHARP approved service facility or SHARP repair service where available.

This calculator has a folding support so it can be positioned easily on the desk for a good operating angle.
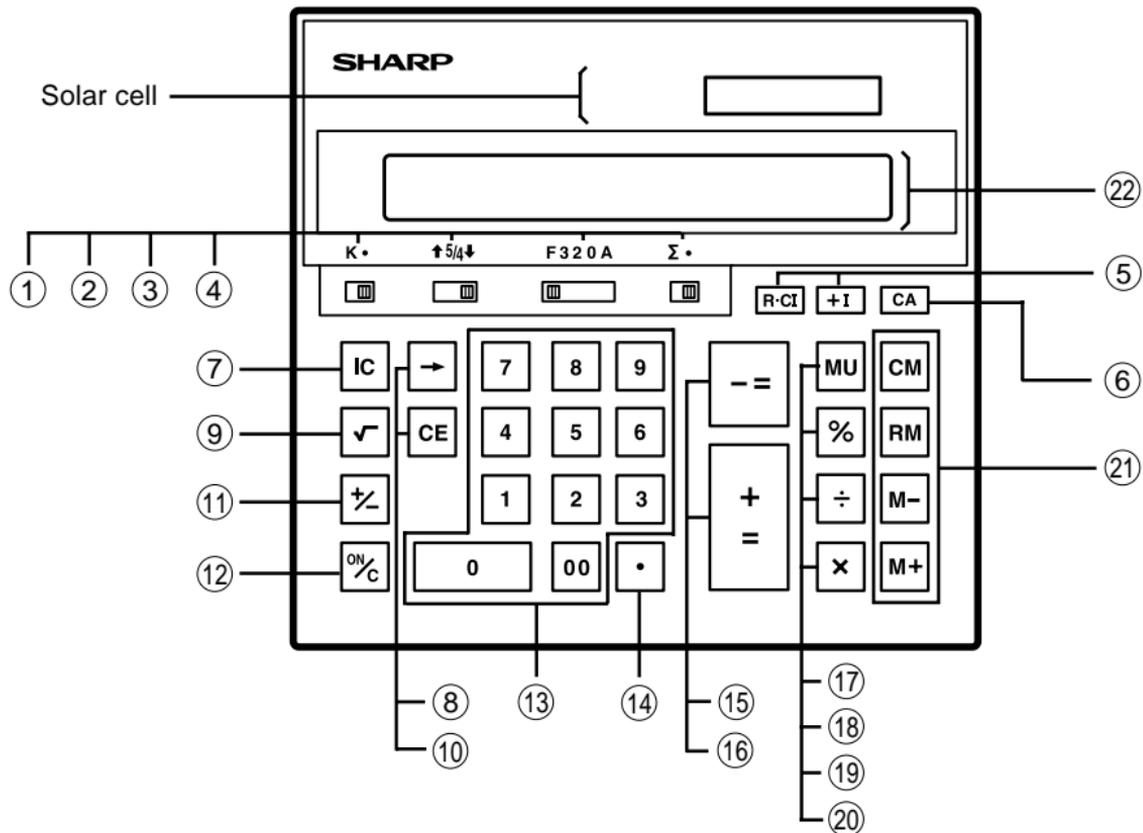(See diagram)

Please press the $\boxed{\text{ON}/\text{C}}$ key whenever you see no indication, or meaningless display figures or signs in the display or the keys do not function despite sufficient light.

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OPERATING CONTROLS

① **K•**

CONSTANT MODE SELECTOR:

"K" position: The following constant functions will be performed.

Multiplication: The calculator will automatically remember the first number entered (the multiplicand) and the $\boxed{\times}$ instruction.

Division: The calculator will automatically remember the second number entered (the divisor) and the $\boxed{\div}$ instruction.

"•" position: Neutral

② **↑5/4↓**

ROUNDING SELECTOR:

"↑" position: In multiplication and division, an answer is rounded up.

"5/4" position: In multiplication and division, an answer is rounded off.

"↓" position: An answer is rounded down.

Note: In addition and subtraction or floating decimal mode, an answer is rounded down.

③ **F 3 2 0 A**

DECIMAL/ADD MODE SELECTOR:

1. Decimal position (F, 3, 2, 0)

   Presets the number of decimal places in the answer.

   In the "F" position, the answer is displayed in the floating decimal system.

2. Add mode position (A):

   The decimal point in addition and subtraction entries is automatically positioned to the 2nd digit from the lowest digit of an entry number. Use of the add mode permits addition and subtraction of numbers without an entry of the decimal point. Use of the $\boxed{\cdot}$, $\boxed{\times}$ and $\boxed{\div}$ keys will automatically override the Add Mode and decimally correct answers will be displayed.

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Example: Set decimal/add mode selector at A, 5/4

A. Enter	12 $\boxed{\cdot}$ 3 $\boxed{\pm}$	Read	12.30
B. Enter	$\boxed{\tfrac{ON}{C}}$ 123 $\boxed{\times}$	Read	123.
	1 $\boxed{00}$ $\boxed{\pm}$		12'300.00
C. Enter	2 $\boxed{\div}$	Read	2.
	3 $\boxed{\pm}$		0.67

④ $\overset{\Sigma\,\bullet}{\square}$ **ACCUMULATION SELECTOR:**

"Σ" position: This selector will accumulate the following:

1. Numbers entered or answers obtained with the $\boxed{\pm}$ and $\boxed{\%}$ keys will be accumulated in the 1st memory register.
2. Numbers entered or answers obtained with the $\boxed{-=}$ key will be subtracted from the 1st memory register.

"$\bullet$" position: Neutral

⑤ $\boxed{+\mathrm{I}}$ $\boxed{\text{R·CI}}$ **2ND MEMORY KEYS:**

MEMORY PLUS $\boxed{+\mathrm{I}}$: Adds an entry or an answer to the 2nd memory. This key also serves as the $\boxed{\pm}$ key when accumulating product and/or quotients in the 2nd memory.

RECALL-CLEAR MEMORY $\boxed{\text{R·CI}}$: Pressed once, recalls the contents of the 2nd memory to the display. Pressed twice, recalls and clears the contents of the 2nd memory.

⑥ $\boxed{\text{CA}}$ **CLEAR ALL KEY:**

Before starting calculation, press this key. This causes the numerical values and calculation commands including memory contents to be cleared.

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⑦ **IC** **ITEM COUNT KEY:**
The counter will count the number of times that the $\boxed{\pm}$ key has been depressed in the addition.

Note: Each time the $\boxed{-=}$ key is used in the subtraction, 1 will be subtracted from the count.

When the $\boxed{IC}$ key is pressed once, the number stored is displayed and may be used for further calculation. To clear the counter, press the $\boxed{IC}$ key twice. The counter has the capacity of a maximum of 3 digits (up to 999). If the count exceeds 999, the counter recounts from 0 (Zero).

⑧ **→** **RIGHT SHIFT KEY:**
Operation of this key in entering numbers or calculated result shifts the number one digit to the right together with a decimal point. Used for one digit correction.

⑨ **√** **SQUARE ROOT KEY:**
Depressed after a number or calculation, calculates the square root of that entry and/or displayed numbers.

An answer is displayed in the floating decimal system.

Example: $5\boxed{\sqrt{}} \rightarrow 2.23606797749$

⑩ **CE** **CLEAR ENTRY KEY:**
Clears a number which has been entered into the machine prior to use of a function key.

Example: Set decimal at 0

$12\boxed{\pm}\ \underset{\underset{\text{Mis-entry}}{\uparrow}}{43}\ \boxed{CE}\ 34\boxed{\pm} \rightarrow 46.$
$(12 + 34 =)$

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(11) $\boxed{+/-}$ **CHANGE SIGN KEY:**
Changes the sign of a number from a positive to a negative or a negative to a positive.

Positive   Negative
Example: 5 $\boxed{+/-}$ → 5.–

(12) $\boxed{ON/C}$ **POWER ON/CLEAR KEY:**
Clears the contents of the calculator, excluding the memory register.
- Press the $\boxed{ON/C}$ key whenever there are no display indicators, meaningless display figures or signs appear or the keys do not function despite sufficient light.

(13) $\boxed{0}$ $\boxed{00}$ to $\boxed{9}$ **NUMERAL KEYS:**
Used to enter numbers.

(14) $\boxed{\cdot}$ **DECIMAL POINT KEY:**
Inputs the decimal place when depressed before or after a numeric entry.
Example: $\boxed{\cdot}$ 7 → 0.7

(15) $\boxed{-=}$ **MINUS EQUALS KEY:**
Subtracts the number from the contents of the calculation register. This key is also used to obtain the product/quotient in negative multiplication and division.

(16) $\boxed{\pm=}$ **PLUS EQUALS KEY:**
Adds the number to the contents of the calculation register. This key is also used to obtain the results in multiplication and division.

(17) $\boxed{MU}$ **MULTIPLE USE KEY:**
Used to perform mark-up, percent change and automatic add-on/discount.

(18) $\boxed{\%}$ **PERCENT KEY:**
Permits entry of actual percentages rather than their decimal equivalents for percent calculations.
Example: Set decimal at 2
150 $\boxed{\times}$ 25 $\boxed{\%}$ → 37.50

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(19) $\boxed{\div}$ **DIVISION KEY:**
Orders division.

(20) $\boxed{\times}$ **MULTIPLICATION KEY:**
Orders multiplication.

(21) $\boxed{M+}$ $\boxed{M-}$ $\boxed{RM}$ $\boxed{CM}$ **1ST MEMORY KEYS:**
These keys have access to the 1st memory register to store, calculate and recall numbers for further use.

MEMORY PLUS $\boxed{M+}$: When depressed after a numeric key or a calculation this key adds the numbers or the result to the 1st memory register.

MEMORY MINUS $\boxed{M-}$: When depressed after a numeric key or a calculation this key subtracts the numbers or the result from the 1st memory register.

RECALLMEMORY $\boxed{RM}$: Displays the contents stored (the answer) in the 1st memory register on the display. It does not clear the contents, but recalls the answer to the display.

CLEAR MEMORY $\boxed{CM}$: Clears the entire contents of the 1st memory register only.

(22) **DISPLAY**

$$123'456'789'012.\frac{^{M\,I}}{^{-}_{E}}$$

M : **1st memory symbol**
Appears when a number is in the 1st memory.

— : **Minus symbol**
Appears when a number is a negative.

E : **Error symbol**
Appears when an overflow or an error is detected.

I : **2nd memory symbol**
Appears when a number is in the 2nd memory.

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POWER SUPPLY

This calculator has a solar cell and is energized by electrical energy produced by the solar cell. The solar cell converts luminous energy directly into electrical energy by utilizing the photovoltaic effect.

Brightness for operation
If the light exposed to the solar cell is insufficient, the calculator is not powered to operate. With the brightness criterion below, operate the calculator **at 150 lux or more**.

Outdoors or by the window:	**Incandescent lamp:**	**Fluorescent lamp:**
Use the calculator where it is not exposed to direct sunlight but receives enough illumination for comfortable reading.	Use the calculator wherever it receives the same illumination as attained within 2.5 meters of a 100 Watts incandescent lamp.	Use the calculator wherever it receives the same illumination as attained within 1.5 meters of a 15 Watts fluorescent lamp.

Backup Battery
If the light exposed to the solar cell is insufficient (150 lux or lower), the backup battery is turned on automatically to operate the calculator.

Replacing the Backup Battery
The backup battery can support the solar cell for approximately seven years at room temperature (20°C/68°F).
If a weak battery is left in the calculator, the memory contents may be lost.

When to replace:
- At least once every seven years, even if the calculator is functioning properly.
- The memory contents become null.
- The display dims in dark places.
- The display will not appear in insufficient lighting by pressing the $\boxed{\text{ON/C}}$ key after the power is automatically turned off.

How to replace:
1. Turn the calculator face down with the folding support at the bottom. Lift the support up.
2. Pressing lightly on the battery cover, slide the cover off in the direction of the arrow. See Fig. 1.
3. Place a pointed object in the space shown in Fig. 2 and, using the object as a lever, lift the battery out.
4. Install the new battery with the ⊕ side up as shown in Fig. 3.
5. Place the battery cover down as shown in Fig. 4.
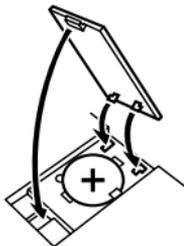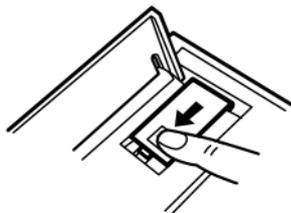6. Slide the cover in the direction shown in Fig. 5 until it clicks into place.
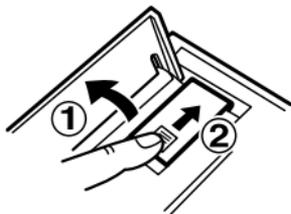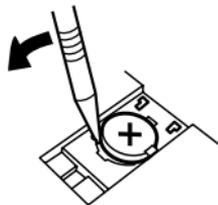
(Fig. 1)   **(Fig. 2)**   **(Fig. 3)**

(Fig. 4)   **(Fig. 5)**

"MEMORY SAFE GUARD" function — The contents of the memory are retained even when the calculator is turned off. A value stored in memory will thus remain until it is changed or until the backup battery runs out.

Automatic Power-Off function (A.P.O.):
This calculator is automatically turned off approximately 7 minutes after the last key operation to save the battery.

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CALCULATION EXAMPLES

NOTE: ■ Depress the $\boxed{CA}$ key prior to beginning any calculation.

If nothing appears on the display during calculation do not continue making entries.

CALCULATION	EXAMPLE	K• ☐	↑5/4↓ ☐	F320A	Σ• ☐	OPERATION	DISPLAY
Addition & subtraction	$125 + 350 + 25 =$	●		0	●	125 ⊞ 350 ⊞ 25 ⊞	500.
Addition and subtraction with add mode	$2.50 + 4.50 - 3.00 =$ Note: The ⨀ key was not used in the entries.	●		A	●	250 ⊞ 450 ⊞ 3 ⓪⓪ ⊟	4.00
Repeat addition and subtraction	$12 + 12 + 12 +$ $45 - 10 - 10 =$	K		0	●	12 ⊞ ⊞ ⊞ 45 ⊞ 10 ⊟ ⊟	61.
Multiplication and division	$12 \times 45 \times 78 =$	●		0	●	12 ⨯ 45 ⨯ 78 ⊞	42'120.
	$840 \div 4 \div 15 =$	●		F	●	840 ⨟ 4 ⨟ 15 ⊞	14.

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CALCULATION	EXAMPLE	K • ⬚	↑5/4↓ ⬚	F320A ⬚	Σ • ⬚	OPERATION	DISPLAY
Square and power calculations	$2 \times 2 = 2^2 =$	●		0	●	2 ⨯ ⟮±⟯	4.
	$2 \times 2 \times 2 = 2^3 =$	K		0	●	2 ⨯ ⟮±⟯ ⟮±⟯	8.
Reciprocal calculation	$\dfrac{1}{7} =$	●	↓	F	●	7 ÷ ⟮±⟯	0.14285714285
Square root calculation	$\sqrt{7} =$	●	↓	F	●	7 ⟮√⟯	2.64575131106
Constant calculations	$\dfrac{295 \times 8 =}{295 \times 6 =}$	K		0	●	295 ⨯ 8 ⟮±⟯ 6 ⟮±⟯	2'360. 1'770.
	$18 \div 2 =$ $12 \div 2 =$	K		0	●	18 ÷ 2 ⟮±⟯ 12 ⟮±⟯	9. 6.
Percent calculations	$650 \times 15\% =$	●		2	●	650 ⨯ 15 ⟮%⟯	97.50
	$123 \div 1368 = (\%)$	●	5/4,↓	2	●	123 ÷ 1368 ⟮%⟯	8.99

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CALCULATION	EXAMPLE	K • ☐	↑5/4↓ ☐	F320A	Σ • ☐	OPERATION	DISPLAY
Memory calculations	● Before beginning, depress the CM key to clear the contents of the memory register.						
	$135 \times \$4.00 = ?(1)$ $150 \times 7.75 = ?(2)$ $\underline{450 \times 3.45 = ?(3)}$ $?(4)$	●		2	Σ	CM 135 × 4 M+ 150 × 7.75 M+ 450 × 3.45 M+ RM	540.00 M (1) 1'162.50 M (2) 1'552.50 M (3) 3'255.00 M (4)
	$30 + 4 = ?(1)$ $15 - 3 = ?(2)$ $\underline{2 \times 10 = ?(3)}$ $?(4)$	●		2	●	CM 30 ± 4 ± M+ %C 15 ± 3 -= M+ 2 × 10 M+ RM	34.00 M (1) 12.00 M (2) 20.00 M (3) 66.00 M (4)
Add-on/discount calculation	$650 + (650 \times 25\%) =$	●		2	●	650 × 25 % ±	162.50 812.50
	$650 - (650 \times 25\%) =$	●		2	●	650 × 25 % -=	162.50 487.50

PERCENT MARK-UP BASED ON COST (MU)

Calculate the selling price and the gross profit from the cost of $8,160 on the basis of a 15% profit on the selling price.

Calculation method:

$$\text{Selling price} = \frac{8160}{1 - \frac{15}{100}} = ①$$

$$\text{Grossprofit} = \frac{8160}{1 - \frac{15}{100}} - 8160 = ②$$

K • ↑5/4↓ F320A Σ •
▢ ▢ ▢ ▢

ENTER	DEPRESS	DISPLAY
8160	÷	8'160.
15	MU	9'600.00 ①
	MU	1'440.00 ②

PERCENT MARK-UP BASED ON SELLING PRICE (MU)

Calculate the cost and the gross profit from the selling price of $9,780 on the basis of 20% profit of the cost.

Calculation method:

$$\text{Cost} = \frac{9780}{1 + \frac{20}{100}} = ①$$

$$\text{Grossprofit} = 9780 - \frac{9780}{1 + \frac{20}{100}} = ②$$

K • ↑5/4↓ F320A Σ •
▢ ▢ ▢ ▢

ENTER	DEPRESS	DISPLAY
9780	÷	9'780.
20	+/− MU	8'150.00 ①
	MU	1'630.00 ②

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AVERAGING

Calculate the average of a series of values.

EXAMPLE:

Day	Sales
Monday	$123.15
Tuesday	118.00
Wednesday	131.58
Thursday	125.02
Friday	158.25

Total Sale $656.00 for 5 days

Average Sales = $131.20 .... ③   ①   ②

Note: If you are working in dollars and cents, use the "Add Mode." If not, set the decimal as desired.

K• ↑5/4↓ F 3 2 0 A Σ •

OPERATION	DISPLAY	NOTE
IC IC %̲	0.	
12315 ±̲	123.15	
118 00 ±̲	241.15	
13158 ±̲	372.73	
12502 ±̲	497.75	
15825 ±̲	656.00	①
÷ IC	5.	②
±̲	131.20	③

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USING THE 2ND MEMORY

EXAMPLE: $$\frac{(874 - 557) \times (7 + 8)}{(1746 + 876) \div (12 + 23)} =$$

K • ↑5/4↓ F 3 2 0 A Σ • ▥ ▥ ▭ ▥ ▥	
Operation	Display
R·CI R·CI CM %	0.
12 M+ 23 M+	23. M
%	0. M
1746 ± 876 ±	2'622. M
÷ RM	35. M
CM M+	75. M
%	0. M
874 +I	874. M I
557 +/− +I *	557. M I
%	0. M I
7 ± 8 ±	15. M I
× R·CI	317. M I
÷	4'755. M I
RM	75. M I
±	63. M I

* : To store a negative number, use the +/− before the +I.

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ERRORS

There are several situations which will cause an overflow or an error condition.

When this occurs, an error symbol "E" will be displayed.

The $\boxed{\%}$, $\boxed{CE}$ or $\boxed{\rightarrow}$ key must be pushed to restart the calculation.

The contents of the memory at the time of the error are retained.

1. Entry of more than 12 digits.

   (The first 12 digits of an entry number and an error symbol "E" are displayed. In this case depress the $\boxed{CE}$ or $\boxed{\rightarrow}$ key.)

2. When the integer portion of an answer exceeds 12 digits and does not exceed 24 digits

   OVER FLOW CALCULATION

   Ex. Set the decimal at "F"

   908770000000 $\boxed{\div}$ .0326 $\boxed{\times}$ → 27.8763803680ᴇ

   $\boxed{CE}$ → 27.8763803680

   874 $\boxed{\pm}$ → 24'363.9564416

   (24,363.9564416 × 1,000,000,000,000 = 24,363,956 441,600,000)

3. When the integer portion of the quotient in percentage calculation is 25 digits.

   (Ex. 100000000000 $\boxed{\div}$ 0.00000000001 $\boxed{\%}$)

4. When any number is divided by zero (Ex. 5 $\boxed{\div}$ 0 $\boxed{\pm}$).

5. When the contents of the memory exceed 12 integers.

   (Ex. $\boxed{CM}$ 999999999999 $\boxed{M+}$ 1 $\boxed{M+}$)

6. When the square root of a negative number is calculated. (Ex. 5 $\boxed{\pm}$ $\boxed{\sqrt{\ }}$)

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SPECIFICATIONS

Type:	Electronic calculator
Operating capacity:	12 digits
Decimal point:	Read in: Floating up to 11 decimal places
	Result: Decimal-Set (F, 3, 2, 0) with add mode
Calculations:	Four arithmetic calculations, Constant calculation, Add mode in addition and subtraction, Square calculation, Chain calculation, Power calculation, Percent calculation, Reciprocal calculation, Add-on calculation, Discount calculation, Memory calculation, Square root calculation, Mark-up calculation, etc.
Power supply :	Built-in solar cell and lithium battery ($3V \dots$ (DC) CR2032 $\times$ 1)
Automatic Power-off:	Approx. 7 min.
Operating temperature:	0°C ~ 40°C (32°F to 104°F)
Dimensions:	185(W) $\times$ 175(D) $\times$ 18(H) mm 7-9/32″(W) x 6-7/8″(D) x 23/32″(H)
Weight:	Approx. 290 g (0.64 lb.) (with battery, without a soft case)
Accessories:	Lithium battery (installed), Soft case, Operation manual

MEMO

MEMO

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